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ABSTRACT

This volume includes student manuals for four units in the Career Oriented Mathematics Program, which was developed to improve computational abilities and attitudes of secondary students by presenting the material in a job-relevant context. The units are titled: (1) Owning an Automobile and Driving as a Career, (2) Retail Sales, (3) Measurement, and (4) Area-Perimeter. The manuals are consumable, primarily consisting of worksheets which provide both mathematical problems and information needed for their solution (tax tables, maps, inventory records, etc.). The unit on area and perimeter presents problems using lattice point displays. Practice examinations are included. (SD)

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CAREER ORIENTED

MATHEMATICS

SE 019 992

FOREWORD

This Career Oriented Mathematics Curriculum was prepared through a contractual agreement between the Berrien County Board of Education and Dr. Michael L. Mahaffey and Dr. William D. McKillip of the University of Georgia. Funding for this effort was provided by a grant from the Georgia State Department of Education, ESEA Title III.

Lossie L. Gaskins, Superintendent
Berrien County Schools

Larry C. Manning, Director
Title III

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STUDENT'S MANUAL

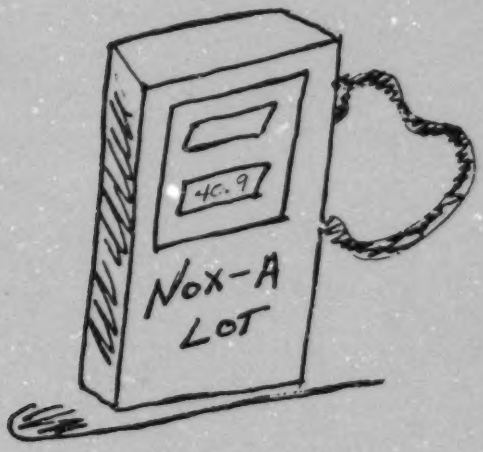
OWNING AN AUTOMOBILE
AND
DRIVING AS A CAREER

Lesson 1

Copy the reasons for and against a high school student having a car.

Reasons Against	Reasons For

Work these problems. If you have trouble ask a friend to help you.



Gas costs 40.9 cents per gallon.
What is the cost of ...

10 gallons? _____

1 gallon ? _____

3 gallons? _____

12 gallons? _____

4.5 gallons? _____

"Put in a dollar regular, please." How much gas do you get for your dollar?

For $1.00 I get about _____. Exactly? _____

For $2.50 I get about _____. Exactly? _____

When class is over put this sheet in your folder.

COMP
(automobile:
optional with Lesson 1.)

MISSION INCREDIBLE

This is your assignment, should you choose to accept it. Go to at least five gas stations, more if you can. At each station write down the price of each kind of gas. Also write down the name of the station.

When you return to class the leader will help you do the calculations at the bottom of the page.

Be polite at all times or the leader will disavow any knowledge of your assignment.

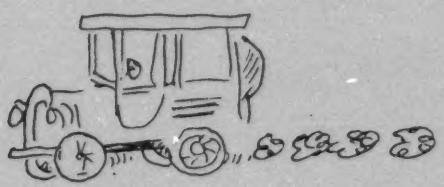
Station Name	Regular	Middle Grade	High Test
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

1. What is the <u>average</u> price of a gallon of regular? Middle Grade? High test?

Lesson 2

Make a list of the expenses you would have if you owned a car. Look at the list on the board and aid others if you think of some.

1.	6.
2.	7.
3.	8.
4.	9.
5.	10.



My car gets 15 miles per gallon of gas.

1. How many gallons will it take to go 255 miles? _____ .
2. How many gallons will it take to go 80 miles? About:_____ Exactly:_____
3. How far can I go on 11 gallons of gas? _____ .
4. I am planning a trip. 105 miles to Brunswick and the same back. Gas costs 42.9¢ per gallon. How much money for gas on the trip? _____
5. How many gallons will it take to go 125 miles? _____
6. If I buy gas at a discount station it costs 37.9 cents per gallon. At a regular station it costs 41.9 cents per gallon. How much do I save per gallon? _____ How much will I save on a trip of 300 miles? _____

Lesson 3

WARNING
WARNING
WARNING

The problems on this sheet are not all the same.

Read each one and <u>think</u> before you compute.

1. John bought 12 gallons of gas at 40.9 cents per gallon. How much did he pay for one gallon? _____

2. My car went 168 miles on 21 gallons of gas. How many miles per gallon did I get? _____

3. Long trip. 1290 miles. 60 gallons. MPG* = _____

4. Mary bought 12 gallons at 40.9 cents per gallon. How much did she pay for the 12 gallons? _____

5. George's car got only 11 miles per gallon. He got a tune up and now he gets 16 miles per gallon. How far can John go on 20 gallons of gas now? _____

6. I get $22\frac{1}{2}$ miles per gallon. How far can I go on a tank of gas? My tank holds 16 gallons. _____

7. George went 438 miles on 32 gallons of gas. How many MPG did George get? _____

8. Sam's car needs a tune up. He went 195 miles on 21 gallons of gas. How many MPG did Sam get? _____

*can you guess what MPG stands for?

COMP
(automobile: optional
with lesson #4)

MISSION INCREDIBLE

This is your assignment, should you choose to accept it. Assemble a Mission Incredible Team of two or three.

(1) Go to a used car dealer or to the used car section of a new car dealer. Select a time when he is not busy with a customer.

(2) Introduce yourself and tell him you are studying in school a unit on owning a car. Ask his help in getting the following information. For 10 or more cars get 1) The make (ford, chev, etc.), 2) The year, 3) The mileage and 4) The price. Fill out the table below:

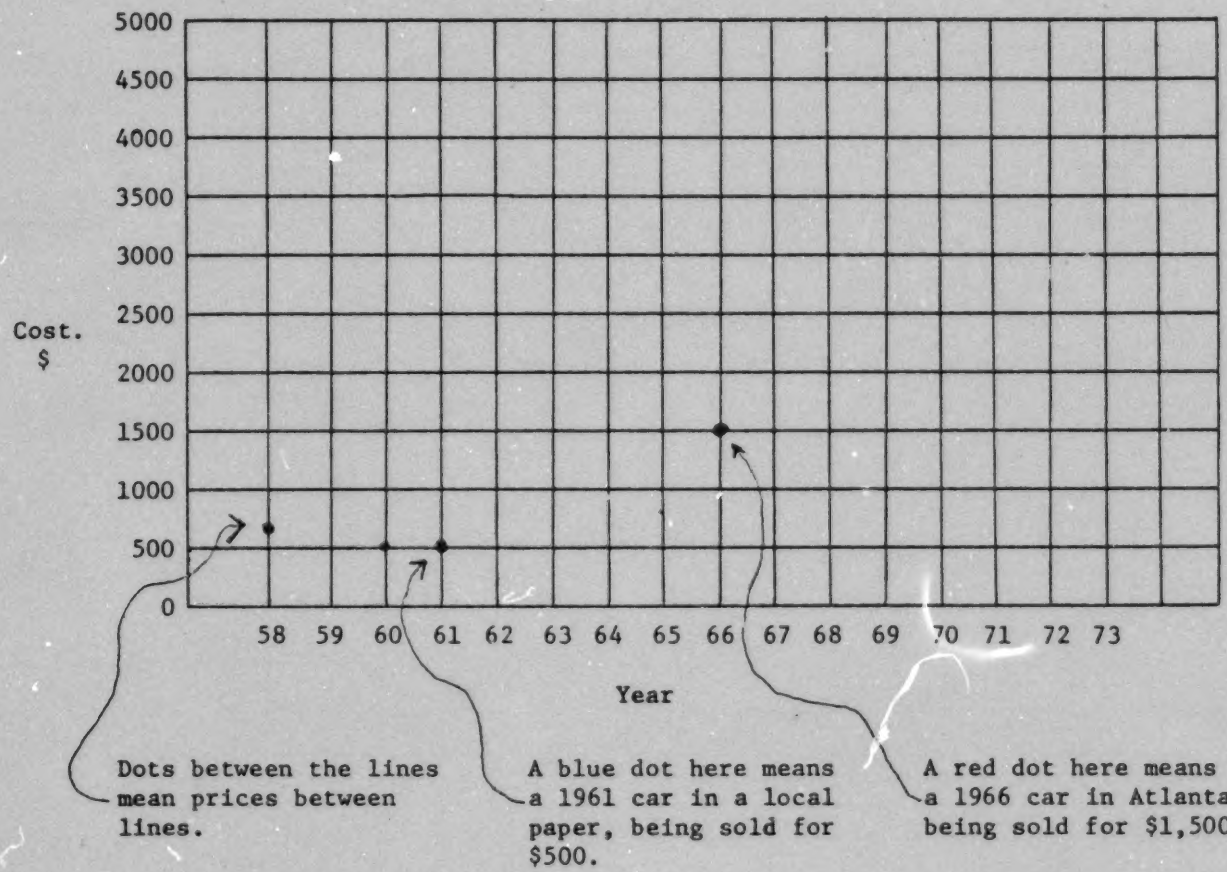
Dealer Visited _____

Auto	Make	Year	Miles	Price
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

(3) Remember, you must be polite at all times or the leader will disavow any knowledge of your mission.

MISSION INCREDIBLE

This is your assignment, should you choose to accept it. You will need a Mission Incredible Team of three or four people. From Atlanta papers and local papers get information on at least 150 used cars and make a graph like this one. Use large paper so your graph can be displayed in class.



Use red dots for 100 cars advertised in the Atlanta newspaper and blue dots for 50 used cars advertised in local papers. When you complete this assignment you will be asked to pass the graph in the classroom and to tell the class about it.

Lesson 5

For each of the following problems use the payment tables that your teachers will furnish.

James is going to purchase a 1967 Mustang for $800 from a used car dealer. He has decided to borrow the money from the bank.

1. How much would his monthly payments be if he borrowed the money for 21 months?

2. How much will he pay back over the 21 months?

3. How much did the loan cost him?

4. If he had made the loan for 30 months, how much more would it have cost him?

5. Find the difference in the cost for a $600 loan for 12 months and 21 months.

6. If we borrow $575 for 30 months we have to figure our payments as follows:

   (a) $575 is not listed in the table as such, we must do some addition.

   (b) The payment for $500 is $19.44.

   (c) The payment for $75 is $2.91.

   (d) Thus the payment for $575 is

   payment for $500.00 + payment for $75.00 or

$$\begin{array}{r} \$19.44 \\ +\ 2.91 \\ \hline \$22.35 \end{array}$$ per month.

Now see if you can find the monthly payment for a loan of $1480 for 12 months.

Lesson 6

Mary is 17 years old and has a 1970 Mercury Cougar. If she borrows the money to buy the car she must pay $187.30 for the insurance for six months.

1. If she doesn't have to finance the car the insurance will cost $91.80. How much will she save?

2. If her parents own the car it will cost 30% less. How much will the insurance cost now?

   30% of 91.80 = _____

   $91.80 - discount = _____

3. If her parents also have their car insured with the company there will be another 10% discount. What would the cost of the insurance be now?

4. What would the cost of the insurance be for a full year? (use problem number 3)

5. John is 18 years old and has purchased a 1974 Dodge Challenger. The insurance is going to cost him $417.00 per six months. If his parents buy the insurance it would be 30% less. What would it cost if his parents buy the insurance?

Career: Taxi Driver

George Allen is going to a driver training school in Atlanta. He is learning to handle large tractor-trailer rigs. To support himself while taking the course he works part time as a taxi driver. George works 10 hours per day, 3 days per week. The company pays him 45% of the fares he takes in. Why does George work only 30 hours each week?

George's total fares for his first week on the job were $137.95. How much did George get paid that week?

$_____.

George gets 45% of $137.95. Figure here:

How could George increase his earnings? He can't work more than 30 hours per week and still go to school!

The 6th week on the job George earned $90.00 <u>himself</u>. About how much did the company get? About what were his total fares for that week?

45% of George's Fares is $90.00. How much were George's Fares?

The meter on George's taxi works like this: It registers 50 cents for the first 1/5 mile and 25 cents for each 1/5 mile after that.

How much would it cost to ride one mile in George's taxi?

Work it out:

*Ask your teacher for a "Mission Incredible" assignment if you want extra credit!!

Mission Incredible

This is your assignment and you may do it by yourself for extra credit.

Remember, George's taxi meter charges 50¢ for the first 1/5 mile and 25¢ for each 1/5 mile after that.

Make a graph showing how much it costs to ride in this taxi for trips from 0 miles to two miles.

When you have finished making the graph you will be asked to show it to the class and tell why it looks like it does.

George usually gets a tip, particularly if he helps passengers with luggage. After a few weeks George found that his tips averaged 12% of his fares.

During one week George's fares came to $211.00.

(a) How much did George make from his percentage of the fares? _____

(b) How much did he make on tips? _____

(c) What was his total income that week? _____

(a) George gets 45% of the fares.

(b) Tips run about 12% of fares

(c) Total

Mission Incredible

The accountants problem: The taxi company estimates that it costs them $27.50 per week in overhead to keep each cab running. This figure does not include operating expenses which are 21.5 cents per mile the cab runs. During one week George Allen turned in this report:

Operator's Report	
Operator: George Allen	
Miles with meter on	142.5 miles
Miles with meter off	63.5 miles
Fares collected	$192.75

The accountant must now calculate (1) George's wages, (2) the cab company's share, (3) the cost of operating the cab, and (4) the cab company's profit.

If you were the accountant, could you find these figures?

(1) _____

(2) _____

(3) _____

(4) _____

Taxi Driver's Problems, #1

1. In one week George took in $187.50 in fares. The company pays him 45% of his fares as his wages. How much does he earn that week?

2. George estimates that his tips run between 10 and 15 percent of his fares. How much would his tips be that week?

3. Find 45% of $217.40. _____

4. What is 32% of $58.75? _____

5. 12% of $235.00 = $_____

6. What is 71% of $85.22? _____

7. Find 55% of $187.95._____

8. What is 85% of $395.22? _____

Taxi Driver's Problems #2

1. In one week George earned $81.00. How much did he take in during that week in fares?

2. In one week George got $25.20 in tips. This was 12% of his fares. How much did George take-in in fares that week?

3. 12% of a number is $24.00
   What is the number?

4. 55% of a number is $137.50
   What is the number?

5. 10% of a number is $13.00
   What is the number?

6. 45% of a number is $36.00
   What is the number?

7. 15% of a number is $9.00
   What is the number?

8. 85% of a number is $170.00
   What is the number?

Taxi Driver's Problems #3

1. One day George's meter broke and he had to figure his fares from the odometer of his car. One man went 2.2 miles in George's cab. What should George charge him?

   HINT: two tenths (.2) of a mile is the same as 1/5 of a mile.

2. A ride of .8 miles costs _____

3. A ride of 1.6 miles costs _____

4. A ride of .7 miles costs _____

5. A ride of 3.1 miles costs _____

6. A ride of .3 miles costs _____

7. A ride of 4.5 miles costs _____

8. A ride of 1.2 miles costs _____

Career: Routeman

After finishing his training course for handling trucks, George got a job as a routeman for a bakery. He wanted to be a long distance trucker but no jobs were open. As a "routeman" George had a light panel truck which was stocked each morning with baked goods. George's route goes through 7 towns and has 23 food stores as established customers. At each stop, George fills out a sales slip like this one showing what the store bought from him. He collects the money, delivers the baked goods from his truck and places them in the store.

Because George handles a lot of money, he is "bonded." Do you know what that means?

AAA Bakery Delivery

Routeman: _____

Sold to: _____

Quan.	Item	Price

At the first store, the Adel Superette, George sold the following: items:

20 loaves white bread, .18 cents each

10 loaves whole wheat, .21 cents each

15 packages rolls, .13 cents each

20 packages Hot Dog buns, .25 cents each

20 packages Hamburger buns, .25 cents each

How much did George collect at that store?

(Now fill out ticket 1 on the next page)

George is paid $125.00 per week plus 5% of his sales. If you were George, how would you plan to increase your pay for that job?

During his third week on the job George's sales were $935.15. How much did he earn that week?

How much did he earn?

---

(1)

AAA Bakery

Routeman:_____

Sold to:_____

Quant.	Item	Price

(2)

AAA Bakery

Routeman:_____

Sold to:_____

Quant.	Item	Price

(3)

AAA Bakery

Routeman:_____

Sold to:_____

Quant.	Item	Price

(4)

AAA Bakery

Routeman:_____

Sold to:_____

Quant.	Item	Price

Routeman's Problems #1

1. Here is the information from the next three stores that George went to. Use this information to fill out sales slips 2, 3, and 4.

Item	Cost Each	Number Purchased by Adel Kroger	Nashville Quick Stop	A & P
White Bread	.18	50	10	30
Whole Wheat Bread	.21	30	5	15
Rolls	.13	20	10	20
Hot Dog Buns	.25	42	12	17
Hamburger Buns	.25	36	10	25

2. George started out with $25.00 in change. After these four stops he counts his cash. How much should he have?

3. $.27
x 35

4. $1.82
x 12

7. $4.35
2.93
18.14
6.51
3.27
+ 5.81

5. $.72
51

6. $.13
x 92

Routeman's Problems #2

1. In his best week with the bakery, George sold $1,352.85 in baked goods. How much did he earn that week?

2. George's sales during February of that year were: First week $987.50, Second week $1,056.20, third week $827.50, fourth week $1,175.80. How much did George earn during February?

3. $3.21
x 15

4. $ .84
x 32

5. $ .95
x 17

6. $ 3.42
6.21
.59
11.82
1.76
+ 19.95

7. $8.27
4.32
.21
9.61
.43
8.52

Career: Local Truck driver

To get experience driving a larger truck George Allen took a job as a local truck driver for an auto parts firm. Each day George makes out a delivery schedule and loads his truck with the parts ordered by automobile mechanics. He may also pick up items. When he has many deliverys to make or when he has large items to handle he will have a helper.

George got this job even though four other men had applied for the job. If you were the employeer, what would you want to know about George before you hired him?

George earns $4.20 per hour. He will work at least a 40 hour week. How much will George earn for a 40 hour week?

---

40 hours work at $4.20 per hour.

When George works longer than 40 hours in one week he earns "time and a half" for all hours over 40. This provision is a part of the contract which George's union has with his employeer. What does "time and a half" mean? How much will George earn per hour for time over 40 hours?

Regular time pay: $4.20 per hour.

Overtime pay: _____

What is the reason for the "time and a half" provision? Why should a person earn more for working longer hours?

One week George worked 45 hours. How much did he get paid for that week?

Regular pay = $4.20 per hour for a 40 hour week. Overtime pay at time and a half for hours over 40. How much pay for a 45 hour week?

Local Truck driver's Problems #1

1. George's helper earns $2.85 per hour. He is employed for a 40 hour week. How much does he earn per week?

2. In determining the cost of delivery service, both George and his helper must be paid. How much does it cost the company for George and his helper for a 40 hour week?

3. Complete the following problems

Rate of pay	Hours worked	Pay
a. $1.95/hour	15	
b. $2.21/hour	40	
c. $1.57/hour	35	
d. $4.65/hour	20	
e. $3.52/hour	40	
f. $1.75/hour	12	

Local Truck driver's Problems #2.

1. George's helper earns $2.85 per hour. How much will he get per hour for "time and a half?"

2. George's helper worked 50 hours in one week. How much did he earn that week?

3. Work these problems on another sheet. Put answers here.

Hourly Rate	Overtime Rate	Hours	Pay
a. 2.40		42	
b. 1.80		54	
c. 3.95		44	
d. 2.75		52	
e. 1.50		38	

*4. In one week George worked 52 hours and his helper worked 48 hours. They drove the truck 578 miles @$.28 per mile. How much did this delivery operation cost the company that week?

MISSION INCREDIBLE

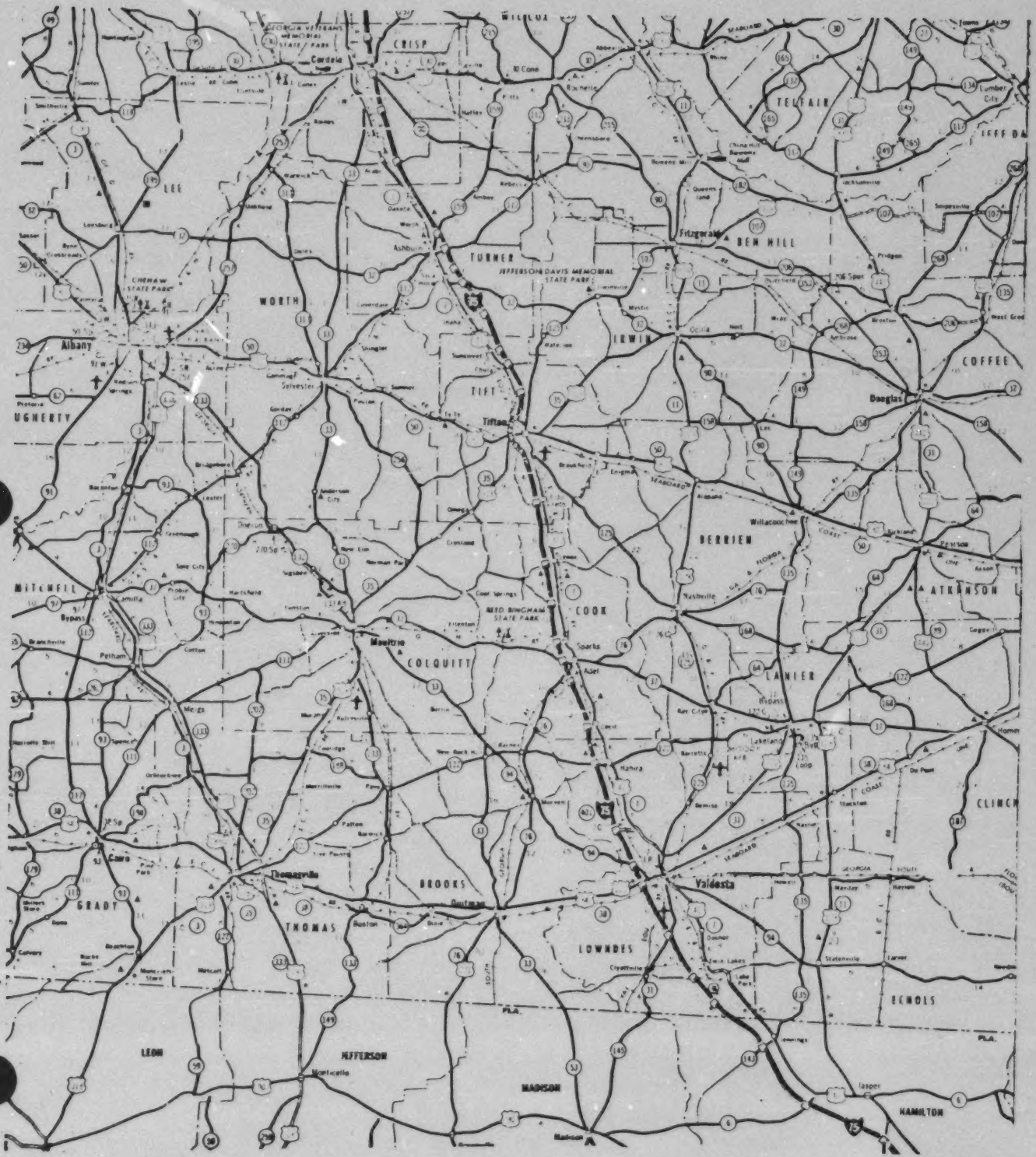
George's company has a warehouse of auto parts in Valdosta and makes deliveries to the following towns: Hahira, Lakeland, Nashville, Willacoochee, Douglas, Camilla, Thomasville, Moultrie, Norman Park, Pelham, and Homerville.

Get a Georgia map and plan a route which will include each of these towns. It costs the company $.28 per mile to operate the truck, so try to find the shortest route.

Get a Georgia map (several if you can) from a gas station and use it to plan various routes which will get to each of those towns. Try to find the shortest route!

COMP
Driving Occupations
Local Truck driver

MISSION INCREDIBLE



Inter-city Driver

After careful screening and passing tests George Allen has a job as an inter-city or "long haul" truck driver. All companies are extremely careful in hiring drivers: The trucks are worth $35,000.00 and the cargo may be worth $200,000.00.

George finds that his pay is more difficult to figure out on this kind of job. He is paid 18 cents per mile for driving and $6.75 per hour for time during which he is not driving. Suppose that in one day George drives 282 miles and spends 3 hours unloading cargo. How much will George earn that day?

George is concerned about the 55 miles per hour speed limit for trucks. Why will this reduce his earnings per hour? If 55 MPH is his TOP speed, how many miles can he go in an hour?

---

282 Miles at $.18 per mile + 3 hours at $6.75 per hour.

How much? _____

Inter-city Driver's Problems #1

1. During one day, George drives 465 miles and spends no time loading or unloading. How much does he earn that day?

2. George can average 62 miles per hour while driving on I-75. How much does he earn per hour when driving at that rate?

3. Calculate George's Earnings for each day and week:

Day	Miles	Hours @ 6.75	Earnings
Mon.	137	4	
Tues.	385	0	
Wed.	0	8	
Thurs.	422	0	
Fri.	275	3	

Total Weekly Earnings_____

4. $\begin{array}{r} 421 \\ \times\ .18 \\ \hline \end{array}$

5. $\begin{array}{r} 352 \\ \times\ .4 \\ \hline \end{array}$

6. $\begin{array}{r} 265 \\ \times\ 1.3 \\ \hline \end{array}$

7. $\begin{array}{r} 162 \\ \times\ 2.3 \\ \hline \end{array}$

8. $\begin{array}{r} 321 \\ \times\ 3.5 \\ \hline \end{array}$

9. $\begin{array}{r} 265 \\ \times\ .36 \\ \hline \end{array}$

George's company has assigned him to a regular Atlanta-Miami run. Using a regional map of the Southeastern U.S., plan a route for George to use on this run. Consider two things: (1) George is paid by the mile for driving the truck so the company wants the shortest route, (2) the company also wants the cargo delivered quickly so they might add a few miles if they could gain time.

Using the regional maps and the Georgia and Florida state maps, plan a route for George to use going from Atlanta to Miami and back. Please do not write on the maps. When you have planned your route, answer these questions:

Inter-city Driver's Problems #2.

1. On the route you have planned, what is the distance in miles from Atlanta to Miami?

2. Estimate the driving time required in this way:
   a. On the Interstate, figure 60 MPH, average.
   b. On highways which are not Interstate, figure 50 MPH, average.
   c. For each town you go through on a highway which is not an Interstate, add 10 minutes.

   How many hours and minutes driving time will be required for the run from Atlanta to Miami?

3. How much money will George earn for one round trip from Atlanta to Miami and back?

The Interstate Commerce Commission limits the driving time for truck drivers. The regulations are, briefly, that no driver may drive for more than 10 hours without an off duty period of at least 8 hours. The regulations also state that no driver may drive more than 60 hours in any 7 day period or more than 70 hours in any 8 day period. Why should the I.C.C. be concerned about the time truck drivers work?

Under the I.C.C. regulations, how long will it take George to get from Atlanta to Miami? How would you now plan the trip?

a. How many rest periods would be needed?

b. Where would you plan to stop? Remember, no more than 10 hours of driving at any time.

c. How many times during a week could George make this trip? How many times during one 8 day period could he make the trip?

George has reached the top of his profession. He has great responsibility and, for a person who likes to travel, see new places, a very desirable job. He can earn a large salary because he has prepared himself for this job.

Discussion Questions

"George Allen is not a real person. I could never do that." Do you agree or disagree?

What did George Allen do to get where he wanted to be? Could you do that?

Would you like more information on how to become a truck driver?

Write to American Trucking Associations
1616 P Street, N.W.
Washington, D. C. 20036

END OF UNIT

STUDENT'S MANUAL

RETAIL SALES

Beginning a Career in Retail Sales

John Wilson

John Wilson graduated from high school in 1972 and went to look for a job. Where could he look for a job? What help is available for people who want to find a job?

Make a list on the right of the places you might go to get help in finding a job.

John wanted a job <u>but</u>, not everybody wants a job. Why would John Wilson want a job? What kind of job should he look for? What kind of job would <u>you</u> look for if you were John Wilson?

When you have had a chance to discuss this in class, make a list of what <u>you</u> would want your job to be like.

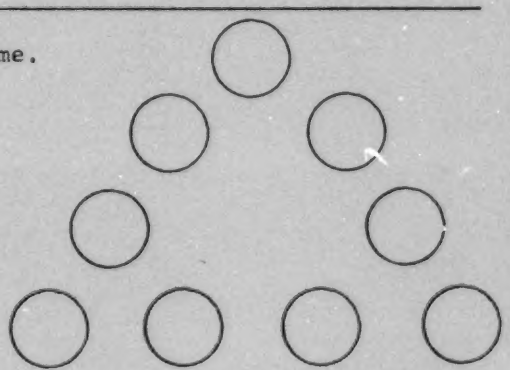
Get newspapers and look in the "help wanted" ads to find what jobs are available at this time. From the available jobs select one which you like best. Copy the ad here, on the right. Make a list of the things you like best about this job. What would you ask the employer when you went to talk to him?

John compared a job paying $2.85 per hour for a 40 hour week and a job paying $3.25 per hour for a 30 hour week. Which one should he select? Why do you think so?

It's a rip off #1

Tear this problem off and work it in your spare time.

Put numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 in the circles so the sum of each line of 4 circles is the same. Use all 9 numbers. Don't use any number twice!



$$\begin{array}{r} \$\ 342.26 \\ 29.58 \\ 651.22 \\ 83.27 \\ 9.52 \\ +\ 386.21 \end{array}$$

$$\begin{array}{r} \$\ 4.38 \\ \times\ 37 \end{array}$$

$$\begin{array}{r} \$\ 235.82 \\ -\ 71.68 \end{array}$$

John Wilson has a job in a woolworth store. His first job was working with stock. He checks deliveries against the "bill of lading," the paper the truck driver has showing what is to be delivered. He counts the cases of merchandise and stores them in the stock room.

Ball point pens come in boxes of 12, 12 boxes to a carton, 12 cartons in a case. In one order, 5 cases of ball point pens arrived. How many pens was that?

The store manager told John that he can count on selling 4 cartons of pens each week to other businesses. He also knows that he will sell about 50 pens to individuals. How long will the supply of pens last? Can you be sure that your answer is exactly right? Why or why not?

Practice Problems

39 x 8 = _____

48 x 37 = _____

296 x 82 = _____

469 x 327 = _____

6,192 x 5 = _____

8,961 x 12 = _____

247 x 321 = _____

487 x 297 = _____

John takes inventory of the stock at the end of each month. One of his inventory sheets looks like the next page. His last job is to find out how many of each item is in stock and estimate whether a re-order is needed.

Look at the first line in the inventory. How many black pens are in stock? Record your answer in the proper blank on the inventory sheet.

For each item, the manager wants between a 2 and 3 month supply on hand. If there is one month supply or less the item should be re-ordered. If there is a 3 month supply or more a "sale" should be run to move the excess stock. Why is it bad to be understocked? Why is it bad to be overstocked?

For each item on the inventory sheet figure out how many are in stock and how long the stock should last. Mark "reorder" on items which are short and "sale" on items where there is more than a 3 month supply.

It's a GRUMP! What's a Grump? A GRUMP is a general review of underlying mathematical processes. That's just another way of saying, "problems to work," but not many, only 6. #1:

(a)
$$\begin{array}{r} 342 \\ \times\ 97 \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 2{,}356 \\ 172 \\ 5{,}918 \\ 463 \\ +\ 23{,}591 \\ \hline \end{array}$$

Inventory Page 12 -

Stationery and School Supplies

				Total	Estimated Sales	Reorder?
Pens:	case=12 cartons and cost/case	carton=12 boxes	box=12 pens	(pens)		
Black	3 $181.44	4	2		626/week	
Blue	4 $181.44	3	5		255/week	
Red	1 $181.44	4	15		87/week	
Pads:	case=15 boxes	box=8 pads	single pads	(pads)		
Typing	8 $58.80	2	3		105/week	
Ruled	13 $10.20	21	5		180/week	
Graph	1 $15.30	7	18		10/week	
Tape:	case=8 boxes	box=20 rolls	single rolls	(rolls)		
1/2 in.	2 $18.40	3	18		40/week	
3/4 in.	0 $20.80	23	15		25/week	
Masking	2 $15.20	1	0		15/week	
Mailing	0 $104.00	0	3		10/week	
Pencils:	case=5 cartons	carton=12 boxes	box=12 pen.	(pen.)		
#2	3 $34.56	5	11		650/week	
#3	2 $34.56	1	18		200/week	
#4	0 $36.72	0	23		100/week	
Red	1 $67.68	2	1		25/week	
Blue	1 $67.68	4	2		25/week	
Crayons:	case=7 cartons	carton=5 boxes	single boxes	(boxes)		
8's	2 $5.25	0	12		10/week	
16's	0 $9.80	9	3		5/week	
32's	4 $16.10	1	15		2/week	
Glue:	case=9 cartons	carton=15 boxes	box=8 bottles	(bots.)		
Model	2 $57.24	3	9		235/week	
Elmers	0 $232.20	0	5		50/week	
Powdered	1 $108.00	6	4		10/week	

(c) $\begin{array}{r} 3046 \\ -\ 1239 \\ \hline \end{array}$

(d) $47\overline{)9156}$

(e) $\begin{array}{r} 2\frac{3}{5} \\ +\ 3\frac{4}{5} \\ \hline \end{array}$

(f) $\begin{array}{r} 5\frac{3}{4} \\ -\ 1\frac{1}{2} \\ \hline \end{array}$

John was stacking a shipment of ball point pens in the stock room when the store manager asked him to bring the bill for the pens into the office. The bill looked like this.

Punk Pen Co.

TO: Woolworth

5 cases black ball point pens @ 181.44	$ 907.20
2 cases red ball point pens @ 181.44	$ 362.88
1 case blue ball point pens @ 181.44	$ 181.44
TOTAL	$1,451.52

John asked Mr. Jones, the manager, how much the store made from selling one pen. Mr. Jones told John that he had not figured that out but each pen sells for 29¢, and John could figure the cost from the bill. John said that he didn't think he could do it. "How could you figure the cost of one pen from that bill, anyway?"

Help John work this one. "How much does one pen cost the store?" You will need to find some information to work that problem. Now, how much does the store make on the sale of one pen?

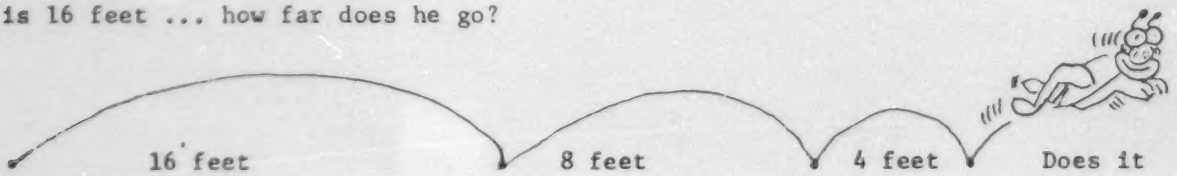
John became interested in the cost of the items which the store was selling. Mr. Jones gave him time to figure out the cost of each item on the inventory sheet. He used the cost per case given on the inventory sheet to find the cost per item.

Find the cost per item of the items on the inventory sheet. Use the table on the next page, fill in only the first two columns at this time.

One way to tell how much profit is made on a sale is to tell the amount in dollars or cents. John did this (you helped) and now knows how much money the store makes on the sale of pens and a variety of other items. Is 18.5¢

It's a rip off #2

A bug hops, but as he hops he gets more and more tired! Each time he hops he goes half as far as he hopped the last time. He hops forever! His first hop is 16 feet ... how far does he go?



Does it bug you?

	Selling Price	Cost Each	Profit (Loss)	Expenses = 41% of selling price	% Profit (Loss)
Pens: Block	29				
Blue	29				
Red	29				
Pads: Typing	1.08				
Ruled	21				
Graph	29				
Tape: 1/2 in.	25				
3/4 in.	32				
Masking	41				
Mailing	1.03				
Pencils: #2	12				
#3	12				
#4	15				
Red	20				
Blue	20				
Crayons: 8's	23				
16's	45				
32's	1.02				
Glue: Model	12				
Elmers	35				
Powdered	15				

a good profit on a sale? Is it good profit on the sale of a 29 cent ball point pen? Is 18.5¢ a good profit on the sale of a $2,000 car?

"Well," Mr. Jones said, "what you think is "profit" is not really what we make on a sale. This store has to run, and all the salaries have to be paid, then what's left over is 'profit.' Last year we took in $127,468.35. We spent $62,528.27 on stock and $52,350.00 in expenses and salaries. The rest was "profit."" How much profit did the store make last year?

Compare the "profit" and the total sales to obtain a percent of profit. Before doing this, let's work some examples with simpler numbers.

(a) 8 is what percent of 50?

(b) 35 is what percent of 68?

(c) 206 is what percent of 182?

(d) $1.58 is what percent of $2.37?

(e) $295.30 is what percent of $856.80?

← ← work over there!

Wasn't that fun? Well, maybe not so much fun, but now we can go back to this one:

Total sales = $127,468.35

Profit = _____

Profit is what percent of sales?

GRUMP

$$\begin{array}{r} 261 \\ \times\ 183 \\ \hline \end{array} \qquad \begin{array}{r} 3507 \\ -\ 968 \\ \hline \end{array} \qquad \begin{array}{r} 12\frac{1}{4} \\ -\ 5\frac{3}{4} \\ \hline \end{array}$$

$$63\overline{)\,29{,}482} \qquad \begin{array}{r} 3\frac{4}{7} \\ +\ 9\frac{5}{7} \\ \hline \end{array}$$

"Now," John said to himself, "I can get an idea how much we make on an item. Our expenses last year were $52,350.00 and total sales were $127,468.35. What percent of the sales goes for expenses?"

"Take the ball point pen: We sell it for 29¢. How much of that goes for expenses? Well, it would have to be 41% of 29¢. I wonder how much that is?" Work it out.

How much profit does the store make on a 29¢ ball point pen? What is the percent of profit on that sale?

John checked another item on the inventory sheet to see if the profit was about the same. He checked on the profit for selling one can of powdered glue. You check this now. What is the profit and percent of profit for powdered glue?

For each of the items on the inventory sheet, find the amount of profit and the percent of profit (or loss).

When the manager wanted to sell the items which were overstocked he asked John to arrange the merchandise and discount the price to the "break even" point. John decided to start with blue ball point pens because the supply in the stock room would last over 6 months, with normal sales.

If you were John, what would you do to promote the sale of blue ball point pens?

What percent discount should be given on the ball point pens? What should the selling price be?

For the nine items which are over stocked (look back on the inventory page) decide whether to have a sale and decide what the sale should be. What is the discount to be offered, the number of "cents off" and the sale price. Fill out the table below:

It's a rip off #3

Ten men meet, all for the first time. Each man shakes hands with every other man. How many hand shakes will there be?

Whew, I'm tired!

Does that shake you up?

Item	%Discount	"Cents off"	Sale Price
Blue Pens			
Red Pens			
Graph paper			
3/4in.tape			
Mask. tape			
Red Pencils			
Blue Pencils			
32's Crayons			
Powder Glue			

QUICKIE

$$\begin{array}{r} 4{,}735 \\ \times \quad 961 \\ \hline \end{array}$$

Get
This
Right
And Win One Gold Star!

After working in the stockroom for several months, John was asked to work as a cashier. Most of the time he had very little arithmetic to do because the cash register added up a customers purchases. He had several things to do which his register would not do for him. One was to figure tax on each purchase. He used a tax table to figure the tax on each purchase:

Amount	Tax	Amount	Tax	Amount	Tax
. 0 - .10	.00	.11 - .35	.01	.36 - .95	.02
.96 - 1.10	.03	1.11 - 1.35	.04	1.36 - 1.95	.05
1.96 - 2.10	.06	2.11 - 2.35	.07	2.36 - 2.95	.08
2.96 - 3.10	.09	3.11 - 3.35	.10	3.36 - 3.95	.11
3.96 - 4.10	.12	4.11 - 4.35	.13	4.36 - 4.95	.14
4.96 - 5.10	.15	5.11 - 5.35	.16	5.36 - 5.95	.17
5.96 - 6.10	.18	6.11 - 6.35	.19	6.36 - 6.95	.20
6.96 - 7.10	.21	7.11 - 7.35	.22	7.36 - 7.95	.23
7.96 - 8.10	.24	8.11 - 8.35	.25	8.36 - 8.95	.26
8.96 - 9.10	.27	9.11 - 9.35	.28	9.36 - 9.95	.29

For amounts larger than 10.00, tax = .30 for each 10.00 + additional shown by table.

After working with this table for a few days he asked Mr. Jones, "How does this work, anyway? I can't tell what the tax should be." What is the rate of tax we pay and how does it work out in the tax table?

John said "Yes, I see that now. But on some purchases a person pays 0% tax. (Which purchasers pay 0% tax?) I wonder what the largest percent of tax would be?" Help John locate the largest percent tax on a purchase. Hint: find it on the first line of the table.

Purchase	tax	Purchase	tax
49¢		24.95	
1.08		137.65	
2.69		4.12	
34¢		453.87	
10.58		9.62	

IT'S A GRUMP #3

(a) 25 is what percent of 135: _____

(b) 43% of 256 is _____

(c)
$$\begin{array}{r} \$\ 348.65 \\ \times \quad 8 \\ \hline \end{array} \qquad \begin{array}{r} \$8,023.46 \\ -\ 947.81 \\ \hline \end{array}$$

When another company buys things from Woolworth an itemized receipt is usually required. This must show the items purchased, the cost per item, total cost of each kind of item tax and total. Of course, John's register will not do this so he makes out these receipts by hand. Why would the company buying from Woolworth need this record? Why would an individual normally not need this kind of record?

On the next page you will find several receipts partially filled out. Complete the arithmetic required for each receipt. Try this one first?

Woolworth & Co.			
#	Item	Unit cost	
3	Boxes,Pens	3.48	
5	Pads, typing paper	1.08	
8	Boxes,#2 pencils	1.44	
2	Boxes,#4 pencils	1.80	
4	Rolls 1/2 in. tape	.25	
11	Rolls,Masking tape	.41	
4	Cartons #4 pencils	21.60	
	Total		
	Discount		

When you have done this example in class you may turn to the next page and finish the four sales slips on that page. Where will you find the information on boxes and cartons that you will need?

The manager was quite happy to supply other firms with their office materials. In fact, he gave a discount to firms on a scale which was based on the size of their order. Why would the manager give a discount to firms placing large orders? John asked "Wouldn't you make more money if you held this stuff and sold it at the regular price?

The manager allowed the following discounts:

any commercial account	1%
over $100.00 on an order	2%
over $500.00 on an order	4%
over $1000.00 on an order	6%.

Go back to the sales slips you have done and fill in the percent discount, the dollar amount of the discount and the net charge.

It's a rip off #4

Three towns, Adel, Sparks, and Lime are on this road. Sparks is twice as far from Adel as from Lime. There is another town which is twice as far from Adel as from Lime. Where is it?
How far is it from Adel?

Woolworth & Co.

#	Item	Unit cost	
4	Boxes,Pens		
2	Boxes,typing pads		
1	Box,3/4in. tape		
1	Box,Mailing tape		
1	Carton,#4 pen.		
5	Bottles,Elmer's		
	Total		
	Discount (%)		
	Net		

Woolworth & Co.

#	Item	Unit cost	
1	Case,Pens		
5	Boxes,typing paper		
1	Box,Ruled paper		
15	Rolls,1/2in. tape		
5	Rolls,Masking tape		
3	Boxes,#2 pencils		
	Total		
	Discount (%)		
	Net		

Woolworth & Co.

#	Item	Unit cost	
5	Cartons,Pens		
2	Boxes,Ruled paper		
1	Box,Graph paper		
1	Box,1/2in. tape		
2	Cartons,#2 pencils		
1	Box,Crayon "8"		
1	Box,Elmers		
	Total		
	Discount (%)		
	Net		

Woolworth & Co.

#	Item	Unit cost	
1	Case,Block pens		
1/2	Case,Blue pens		
1	Case,typing pads		
5	Boxes,Ruled pads		
10	Rolls,3/4in. tape		
2	Cases,#3 pencils		
	Total		
	Discount (%)		
	Net		

The Woolworth Company normally gives a discount to its employees. This discount is the percent of profit plus one half the percent of expenses. This figure is then rounded off to the nearest 5%.

What would the discount be for the store in which John works? Look back in this unit to find the profit and expense figures the manager gave to John. Use these to figure the percent discount.

John figures the discount on several purchases made by employees. He deducted the discount and then registered the amount, rounded off to the next largest cent.

Purchase	Discount	Net
$ 3.47		
$ 9.50		
$ 8.95		
$ 1.46		
$ 35.20		
$ 17.95		
$132.50		
$ .47		

It's A Grump (#4)

(a) $ 27.65
8.40
13.51
+ 7.95

(b) 42 is what percent of 96?

(c) $4.95\overline{)37.68}$

(d) 3.61
x 5.8

(e) $93.05
- 7.95

Everybody makes mistakes...John made a few. One day Mr. Jones showed John this sales slip for an employee sale.

Woolworth & Co. Employee Discount Sale	
One framed picture	
(30% discount)	$18.00
Net	

John said, "Well, Mr. Jones I must have done this in my head. I have forgotten how much that picture cost and how much I charged but I think I can work it out. Give me a few minutes and I will try."

Let's help John, but first let's work a few simpler problems to get the idea.

I am thinking of a number. Half of it is 4. What is the number?

I know a number. 25% of it is 10. What is the number?

32% of a number is 16.
1% of that number is _____.
100% of that number is _____.

15% of a number is 4.50.
1% of that number is _____.
100% of that number is _____.

30% of a number is $9.00.
The number is _____.

2% of a number is $1.96.
What is the number? _____

Now look back to John's problem. The framed picture was sold for an amount we don't know. But the discount was $18.00. So 30% of what is $18.00? Go back and finish filling in the sales slip.

37% of a number is 59. _____
19% of a number is $38.57. _____
42% of a number is 18.3. _____
74% of a number is 74. _____

John was surprised when the manager called him to his office. "John, you can have a better job if you want it." John was offered a job as an assistant manager of a large store in Atlanta. He would also receive training to help him advance to store manager.

John could not decide whether to go to Atlanta. What things would you have to think about if you were offered that job?

John compared the job he had and the job in Atlanta: Local job, $2.78 per hour and a 40 hour week with very little overtime work. Assistant Manager, $850.00 per month and works 50 to 60 hours per week.

Which job do you like?

The job John had working with stock and as a cashier was <u>it</u>. No further room for advancement. Even if the manager quit, another man with manager

training would be given the job. "But," John asked himself, "do I want to be a manager and worry all the time like Mr. Jones? Now I just draw my pay and go home."

What do you say?

Up to now John has been living at home, paying a share of the expenses. He drives a nice car and has money in the bank. "I went up there and looked at apartments, and they want $150.00 to $200.00 per month for a small one. Of course, I looked at some nice places. They have pools and stuff!"

What will happen to John's increased salary if he lives in Atlanta? Will he come out money ahead?

As John thought about these factors he also felt that it would be fun to try big city living.

What would you do?

Grump #5

(a) What is 25% of $437.20?

(b) $2\frac{3}{4} + 5\frac{1}{2}$

(c)
$$\begin{array}{r} 2{,}596 \\ 821 \\ 42{,}765 \\ 348 \\ \underline{5{,}926} \end{array}$$

(d)
$$\begin{array}{r} 42.3 \\ \times\ 5.1 \end{array}$$

(e) 68 of what number is 427?

Retail Sales

HOUR EXAMINATION #1

1. $\begin{array}{r} 346 \\ 82 \\ 9{,}721 \\ +\ 534 \\ \hline \end{array}$

2. $\begin{array}{r} 43{,}062 \\ -\ 5{,}938 \\ \hline \end{array}$

3. $642\overline{)9{,}382}$

4. $\begin{array}{r} 3{,}958 \\ \times\ 467 \\ \hline \end{array}$

5. Mechanical pencils cost $.49 and are packed 12 in a carton. How much will a box of pencils cost?

6. A store usually sells about 50 mechanical pencils per week. In stock the store has 30 cartons of these pencils. How long will this stock last?

7. A carton of pens costs the store $3.48. What is the cost of one pen?

8. How much does the store make on the sale of one carton of pens?

9. $\begin{array}{r} 2\frac{2}{3} \\ +\ 5\frac{2}{3} \\ \hline \end{array}$

10. $\begin{array}{r} 5\frac{3}{4} \\ -\ 2\frac{1}{2} \\ \hline \end{array}$

Retail Sales

HOUR EXAMINATION #2

1. $\begin{array}{r} 436 \\ 2,971 \\ 852 \\ +\ 3,467 \end{array}$

2. $\begin{array}{r} 9,856 \\ -\ 249 \end{array}$

3. $341\overline{)286,471}$

4. $\begin{array}{r} 4,273 \\ \times\ 853 \end{array}$

5. A hardware store buys hammers for $22.20 per dozen. The store has expenses of operation of 25% of sales. What profit do they make on one hammer sold for $3.00?

6. A store makes a profit of 35 cents on an item sold for $2.00. What is the percent profit on that sale?

7. An item which usually sells for $4.00 is to be discounted 35 percent. What will it sell for at that discount?

8. What is the tax on a purchase of $23.95 if the tax rate is 3%?

Retail Sales

HOUR EXAMINATION #3

1. 346.9 + 27.84 + 43.8 + 291.7 =

2. 347.92
   - 16.84

3. 27.1) 265.82

4. 83.61
   x 57.3

5. Complete this sales slip:

Ajax Co.			
Quantity	Item	Unit cost	
5	hammers	2.53	
2	saws	10.50	
8 lb.	nails	76¢/lb.	
1	plane	9.95	
	Total		

6. What is the cost of a $47.20 hair dryer, allowing for an employee discount of 37%?

7. If an employees 35% discount comes to $7.35, what was the amount purchased?

STUDENT'S MANUAL

MEASUREMENT

MEASUREMENT

1. To measure the classroom

Each person is to measure one dimension of your classroom. Your teacher will assign you to measure one of the following:

_____length of the room

_____width of the room

_____height of the room

(Place a check above, by your assignment.)

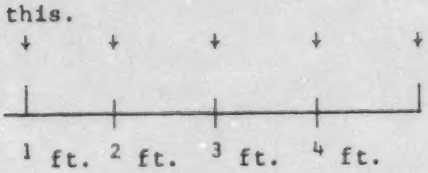
a. Use a ruler. As carefully as you can place the ruler at one edge of your measurement you are to make, mark the end, move in a straight line, count the number of feet in your measure. At the end, if your measure is not exactly an even foot, measure the number of inches. Write your answer here.

_____feet and _____inches

b. Use a "string ruler." Decide how long you want to make your string ruler. Do you want it to be 3 feet, 4 feet, 5 feet, or 6 feet?

My string ruler will be _____feet.

Now take a piece of string and use the foot ruler to mark your string ruler, one foot at a time. Use a pen, pencil, or crayon to mark your string. If you are going to make a 4 foot string ruler, it may look like this.



marks string measure

Now use your string ruler to make your measurement of the room again. You will have to guess (estimate) at how many inches are in your measure if it does not come out

in an even number of feet.

How many times did your string ruler fit?

_____

Multiply this number of times the string fit times the number of feet in your string ruler.

_____ X _____ = _____

number of times string fit	number of feet in string ruler	number of feet in your measure

Did your string ruler fit evenly? _____

If not, add the number of feet and inches to be added.

Total measure _____

c. Use a yardstick or a tape measure to measure the room.

Did you use?	What is your answer?
___a yardstick	___feet and ___ inches
___a tape measure	___feet and ___inches

d. Are there tiles in the floor or cinder blocks on the wall? Measure them. (Are there one foot square tiles? Are the cinder blocks 8 inches?) If so, count the tiles or blocks and estimate your measure.

_____feet _____inches

e. Summary

When you are done, fill in this summary.

I measured: _____ length of the room

(check one) _____ width of the room

_____ height of the room

My answers were:

Using a ruler: _____feet _____inches

Using a string ruler: _____feet _____inches

Using a yardstick ___ _____feet _____inches
or tape measure___

Using tile measures___ _____feet _____inches
or cinder blocks ___

If one measure is very different from the others, you may want to try it again.
When you finish, help one of your classmates finish his Job Card.

2. Class meeting.
When everyone has finished, your teacher will work with the whole class. A table of data will be placed on the board like this: You can copy the data onto your worksheet.

(Data table to be found on following pages.)

Table of Data: LENGTH

Student	By Ruler:	By String Ruler:	By Yardstick:	By Tape Measure	By Tiles or Cinder
1.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
2.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
3.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
4.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
5.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
6.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
7.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.

Now look over the data. Are any of the answers very different from the others? Draw a line through any which the class decides are in error. Now we need to get our best estimate of the length. We will find the mean or average.

How many measures?	_____	_____	_____	_____	_____
What is the total?	___ft. ___in. ___ft. ___in.	___ft. ___in	___ft. ___in.	___ft. ___in.	
Mean: (divide total by number of measures)	___ft. ___in. ___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	

What do you think is the best estimate of the length?

___ft. ___in.

TABLE OF DATA: WIDTH

Student	By Ruler:	By String Ruler:	By Yardstick:	By Tape Measure	By Tiles or Cinder
1.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
2.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
3.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
4.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
5.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
6.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
7.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.

Now look over the data. Are any of the answers very different from the others? Draw a line through any which the class decides are in error. Now we need to get our best estimate of the width. We will find the mean or average.

How many measures?	_____	_____	_____	_____	_____
What is the total?	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
	___ft. ___in.				
Mean: (divide total by number of measures)	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
	___ft. ___in.				

What do you think is the best estimate of the width?

___ft. ___in.

Table of Data: HEIGHT

1.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
2.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
3.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
4.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
5.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
6.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
7.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.

Now look over the data. Are any of the answers very different from the others? Draw a line through any which the class decides are in error. Now we need to get our best estimate of the height. We will find the mean or average.

How many measures?	_____	_____	_____	_____	_____
What is the total?	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.	___ft. ___in.
	___ft. ___in.				
Mean: (divide total by number of measures)	___ft. ___in.	___ft. ___in.	___ft. ___ing.	___ft. ___in.	
	___ft. ___in.				

What do you think is the best estimate of the height?

___ft. ___in.

Summary

Copy the best estimates of the measures here:

length	____feet	____inches
width	____feet	____inches
height	____feet	____inches

Now we will estimate these measures to the nearest foot.

length	____feet
width	____feet
height	____feet

5. To make a scale drawing of the classroom.

1. Select a scale for your final drawing. The scale you select will be used to make the drawing. You must select a scale so that your drawing will fit on the paper. Also, you will want to select a scale which is easy to use. For example, an easy scale to use is to let 1 inch in your drawing represent 1 foot of measure. We could write 1 inch: 1 foot. If your room is 28 feet long, then you would have to draw a 28 inch line to represent 28 feet. But if your paper is only 11 inches long, a 28 inch line will not fit. Thus, you may select a scale that lets 1 inch represent 4 feet. (1 inch: 4 feet). Then a measure of 28 feet would be drawn

28 ft. ÷ 4 ft. per inch = 7 inches.

Following are some scales and some measures. Fill in the length of a line to represent the measures.

scales	measures	length of lines to represent measures
1 inch : 1 foot	27 feet	_____
1 inch : 2 feet	30 feet	15 inches
1 inch : 5 feet	30 feet	_____
1 inch : 10 feet	40 feet	_____
1 inch : 8 feet	40 feet	_____
1 inch : 5 feet	40 feet	_____
1 inch : 4 feet	40 feet	_____

Now think about your drawing. How do you want it to fit on the paper? How big do you want the picture to be?

1 inch : ___feet.

Using this scale, complete the following table:

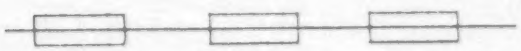
1 inch on the drawing will represent	_____ feet in the room.
2 inches	_____ feet
4 inches	_____ feet
10 inches	_____ feet
1/2 inch	_____ feet
1/4 inch	_____ feet
____inches	12 feet
____inches	10 feet
____inches	1 foot
____inches	5 feet
____inches	6 feet
____inches	4 feet

6. Final Drawing.

a. Draw an outline, to scale, of the room. Label the sides with the measure of the length and width. Try to plan your work so your drawing is neat and accurate, near the center of the paper, and is large enough to see easily. (It is a good idea to work in pencil at first so you can erase unnecessary lines. Also, sharpen your pencil often so your lines are sharp and clear.)

b. Now add some of the important features of your classroom to your drawing. Doors can be drawn like this:

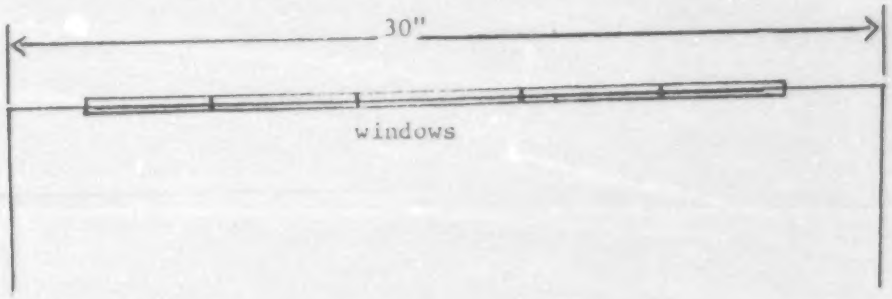
You will have to measure the width of the door and how far it is from a corner.
Windows can be drawn like this:



Again, measure the width of the window and the distance from a corner.
You may want to indicate bookcases, worktables, the teacher's desk, etc.
Make sure you label your drawing and place your name on it.

7. To make a scale drawing of one wing of the school. Your teacher will assign one wing of the school for you to investigate. Each student should work with a partner. Together you can make a rough sketch of the wing, take all the measurements you will need and write them on your sketch.

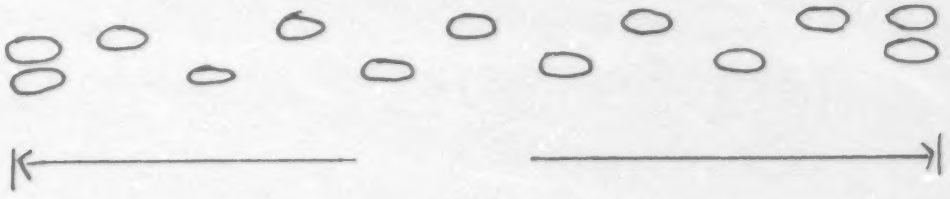
Return to your classroom and make a scale drawing of the wing. Remember to pick your scale carefully, include windows and doors, label your drawing and include your names, with the dimensions on the drawing. Architects and builders often put the dimensions on drawings like this (notice we write the measure not the scale.)



8. To make large measurements outside.

(1) Measure your stride:

Find an area outside where you can walk 10 paces. Put your feet together, make the point of your Right heel, and walk 10 steps starting with your left foot. Step 10 should be your right foot. Bring your left foot up and mark your right heel. Try to pace naturally so each step is comfortable and about the same distance.



Measure the distance with a tape measure or marked string from your starting right heel to your ending right heel. Divide by 10 and you have your pace. Do this about twice or until you obtain about the same pace.

10 steps			Pace	
_____feet	÷	10 =	____feet	(are decimals on feet and inches)
_____feet	÷	10 =	____feet	
_____feet	÷	10 =	_____feet	

your pace

_____

9. Calculate how much fencing material you would need to enclose the school yard. Work with a partner. Locate the school yard boundaries and pace them off. Make a sketch of the yard and write the distances in it. How many feet of fence will you need? How many gates and what sizes?

Feet of fencing: _____ feet.

(enter feet in each side)

_____

_____

_____

_____

_____

_____

Total fencing _____feet.

Gates:	Location	Size (feet)
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

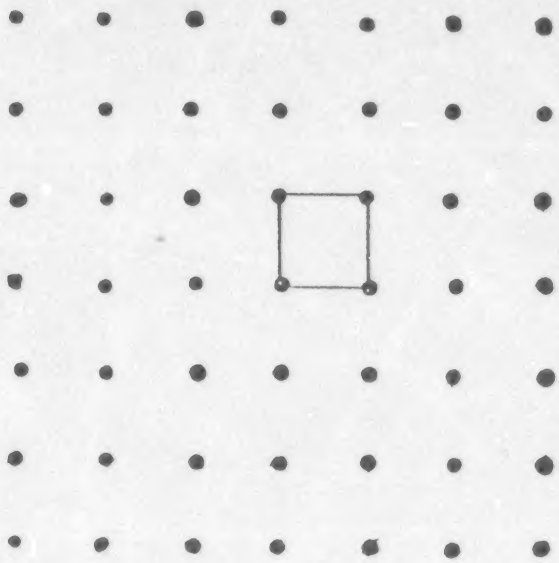
STUDENT'S MANUAL

AREA-PERIMETER

1. AREA

The idea of this lesson is to use a geo-board, or a grid made of dots, to look at the properties of area and perimeter also, you will have a chance to discuss some patterns through the activities presented here.

Figures are formed on the geo-board by stretching rubber-bands around nails or by drawing lines from dot-to-dot if you are using a picture of a geo-board. We can then use these figures in finding area or perimeter. For example the figures below is a square that has an area of 1 square unit.

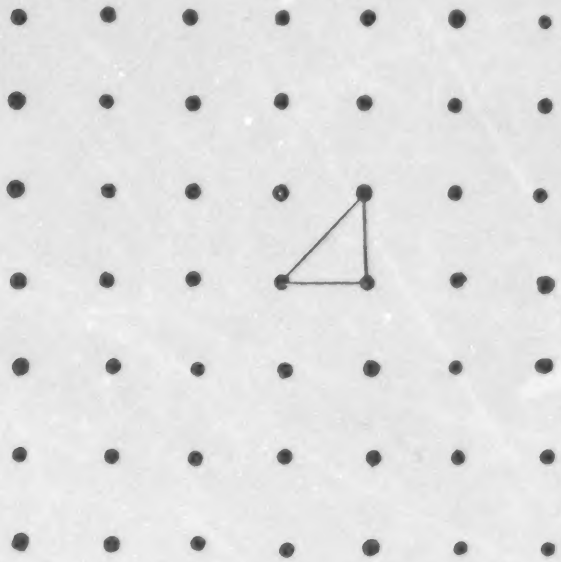


Using the grid paper provided draw a rectangle that would have an area of 2 square units.

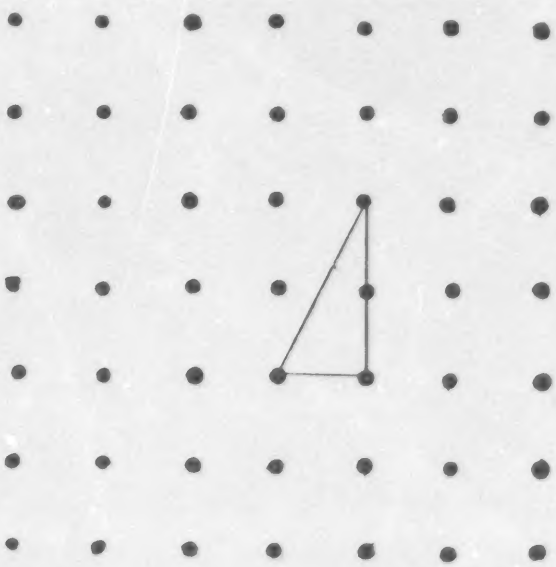
Now that you have done this draw a square that has an area of 4 square units.

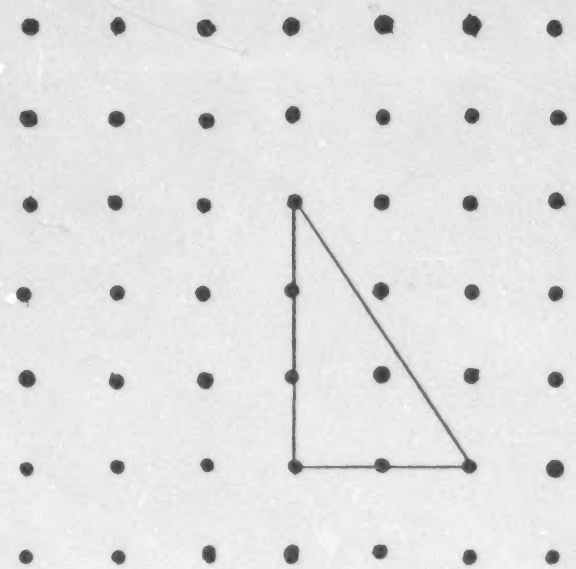
At this point your teacher will give you some other examples to work. Complete these before continuing.

Now that you can find these areas, can you give the number of square units in the following figure?*



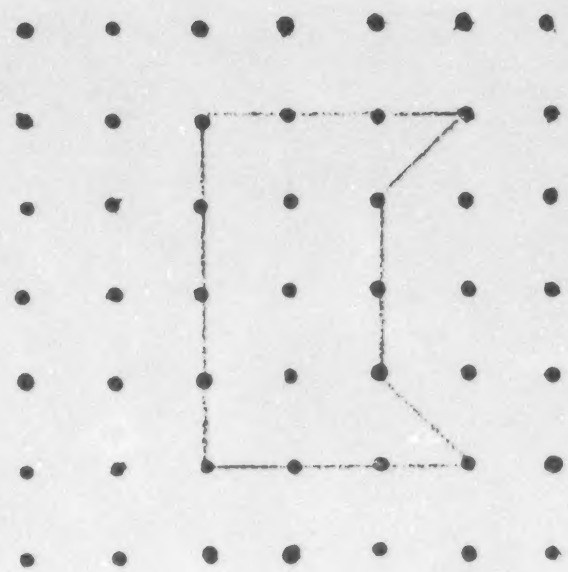
Try to count the area of the following two figures. Once you are through the class should discuss hwo the area can be found.

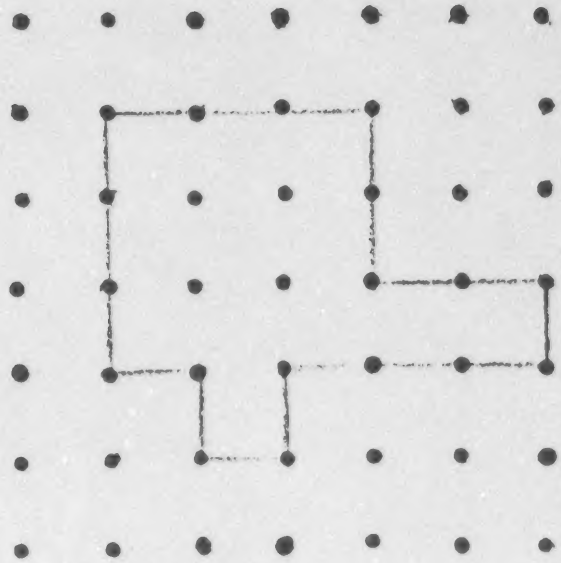


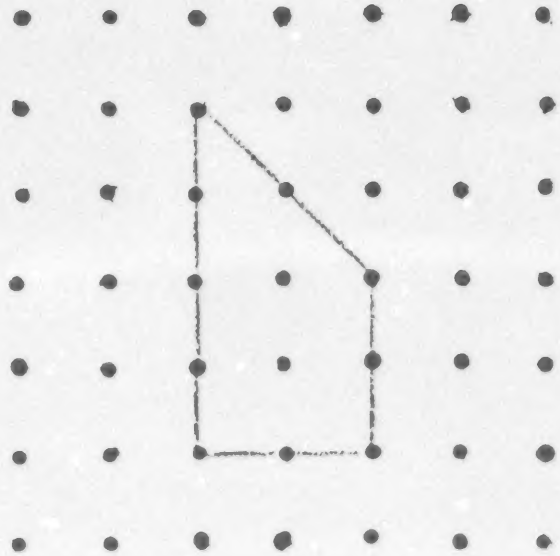


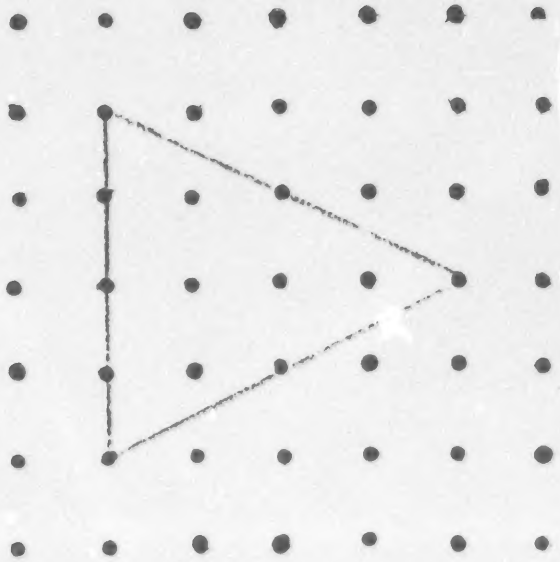
Now find the area of each of the figures in the assignment your teacher has given you.

NAME _____

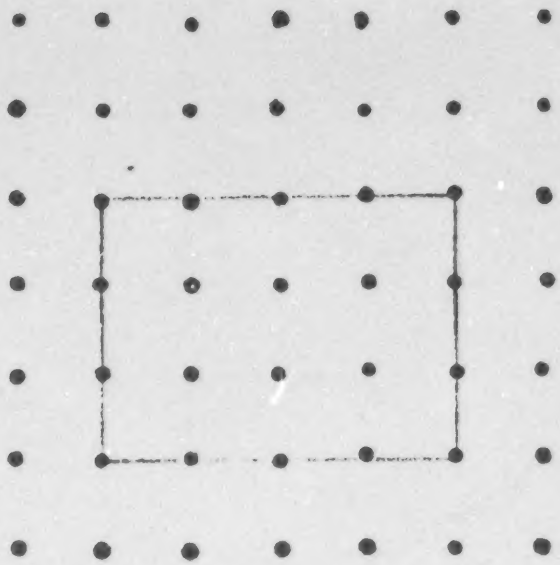


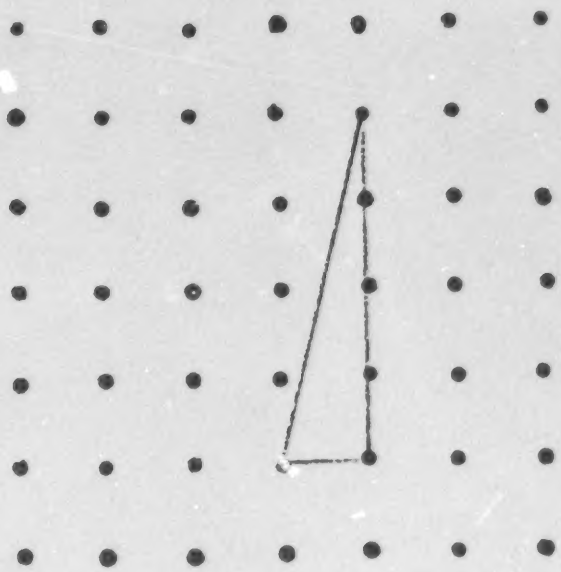


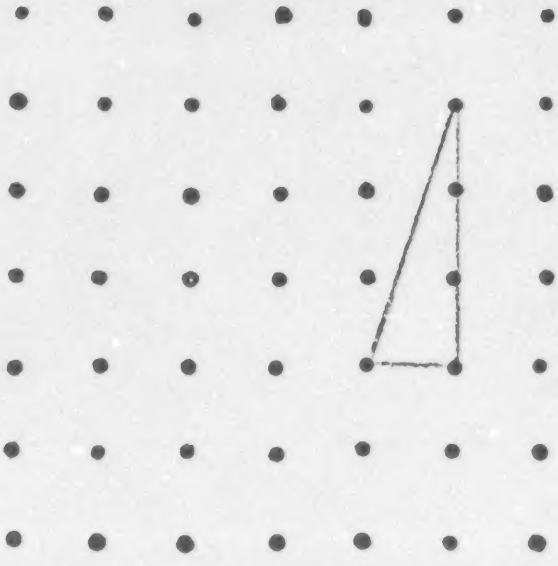


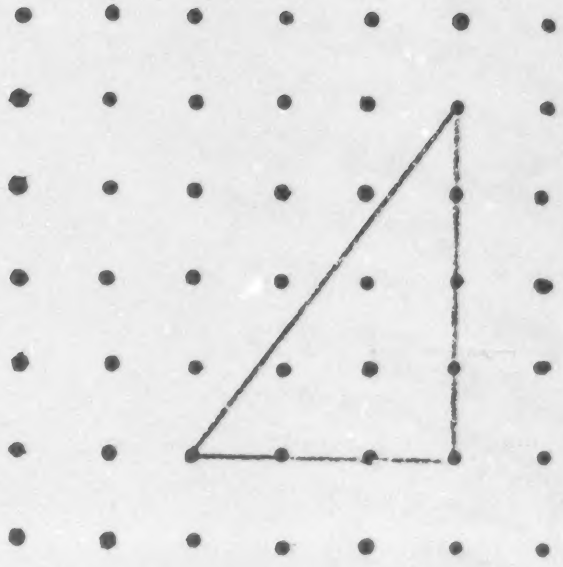


NAME _____



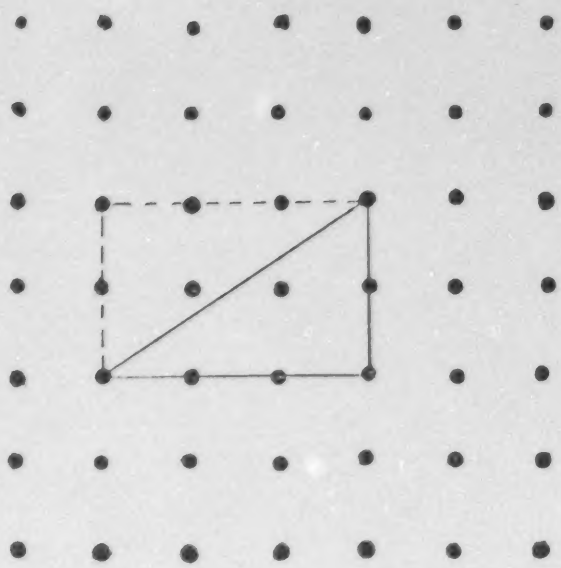






2. AREA (con't)

Now that you have learned a basic way of counting area, lets try something a little bit harder. In the first problems you just had to think of a rectangle or square to get the area, for example:



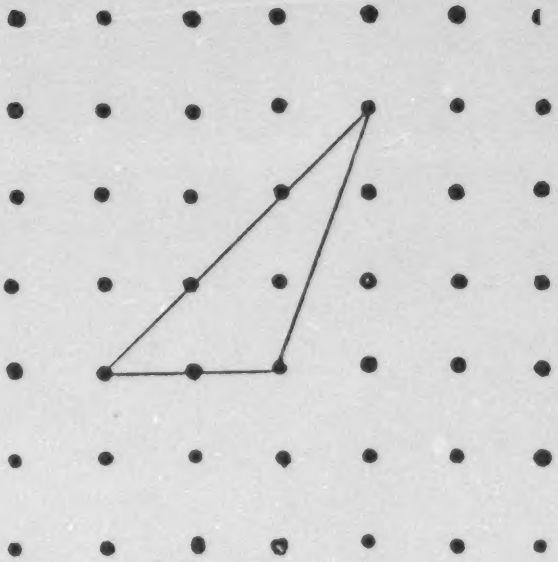
If we wanted to count the area of the above figure I would do the following:

(a) Draw in or imagine the rectangle as shown by the dotted lines.

(b) Point the area of the rectangle (6 sq. units).

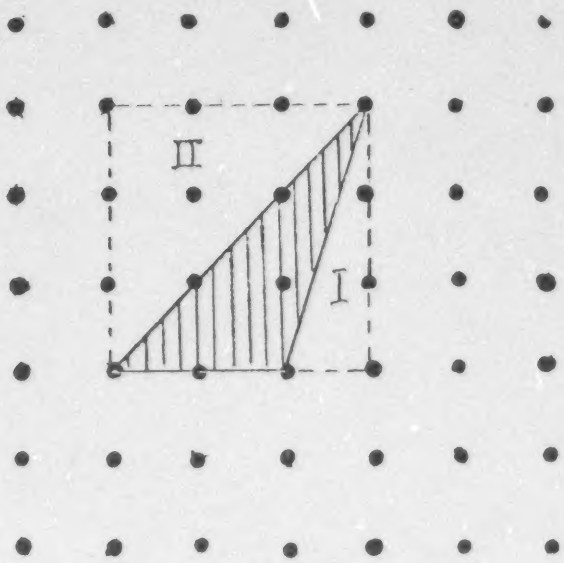
(c) Since the triangle takes up half of the rectangle it's area is 3 sq. units.

This method can't always be used for example look at the following figure.



Let's find it's area:

(a) Start again by drawing or imagining a rectangle or square (shown below)



(b) We want the area of the figure that is shaded. Therefore, we need to find out what part of the square we don't need.

(c) We don't need part I and part II.
What is the area of Part I_____?
Part II_____?

(d) What is the area of the square_____?

(e) Thus, the area of the shaded figure is the area of the sq.-the area of Part I and II.

(f) What is the area of the shaded figure?
_____*

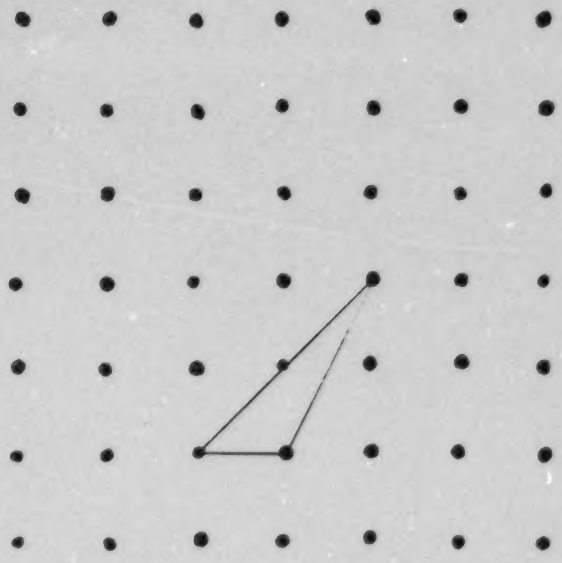
Now try to find the area of the four practice problems given to you by your teacher. The class should discuss the solutions after each one.

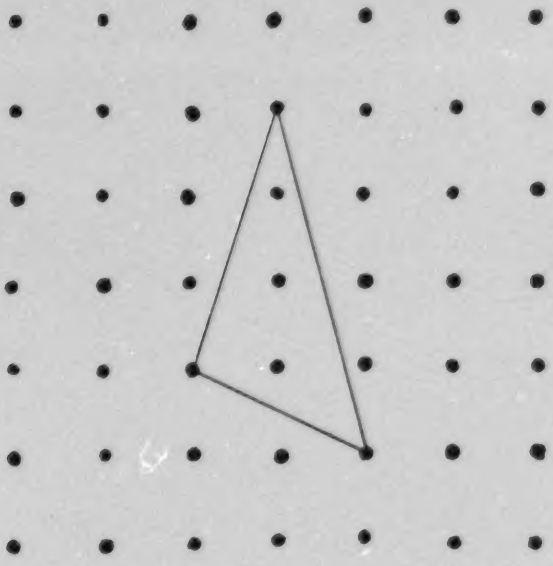
3. Summary (Area)

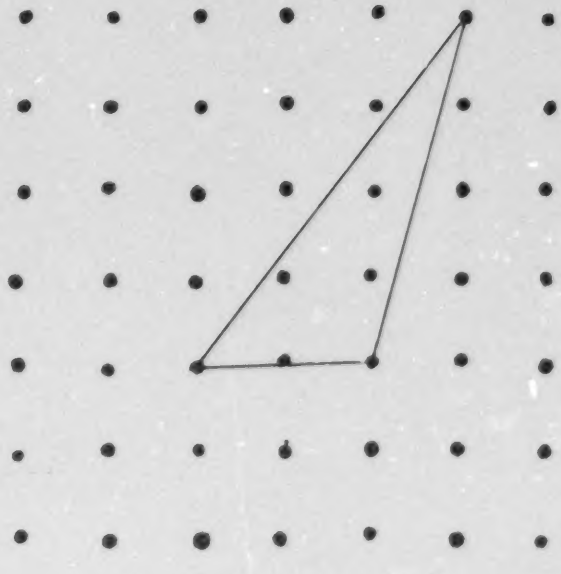
For this lesson you will be placed in groups of three or four students. This is done so you will have an opportunity to talk about problems you are not able to work. However, you should work as many as you can by yourself. The following assignment will give you a chance to use both methods to find area on a geoboard. Also, there will be some vocabulary you may not know. If this should happen, discuss the words among yourselves. If none of you know what the word means then ask your teacher.

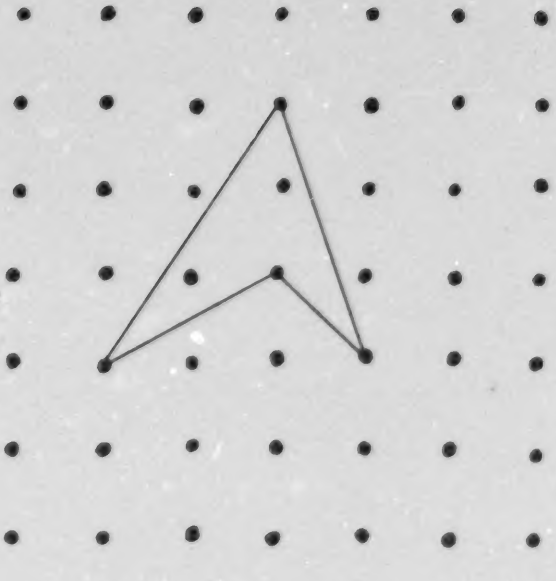
PRACTICE SET 1

NAME _____

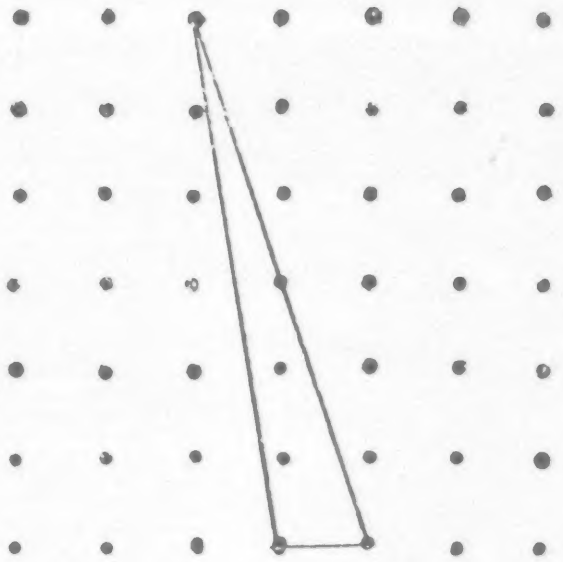


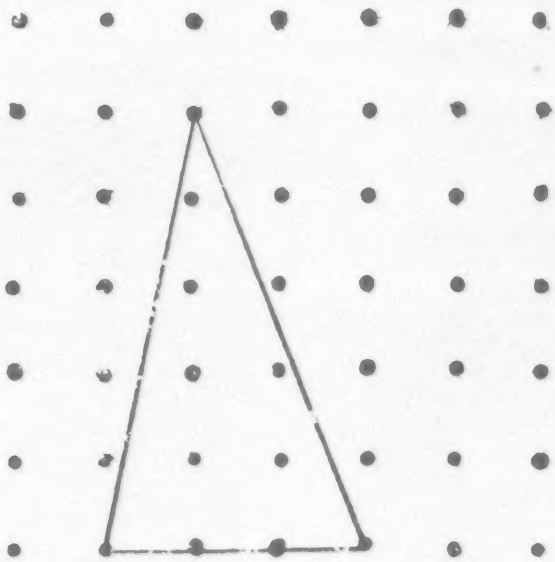


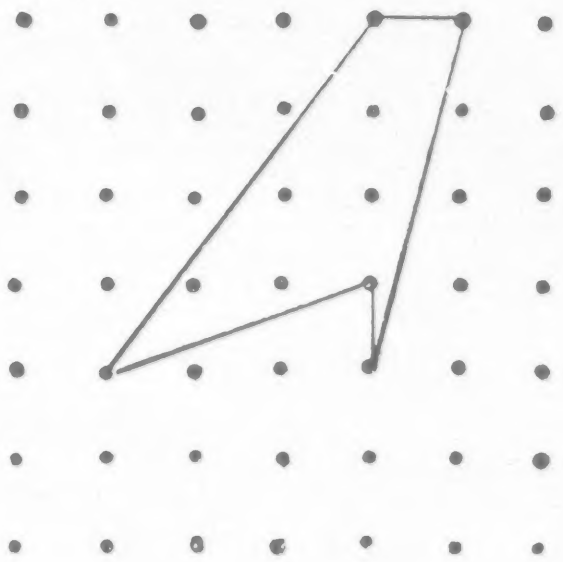


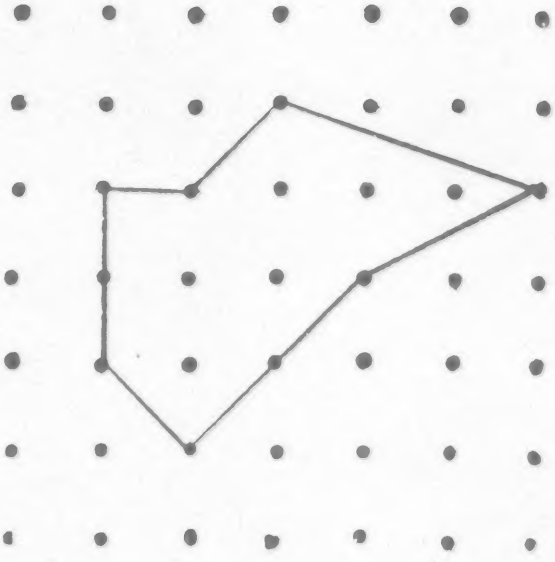


LESSON NUMBER 2 NAME _____

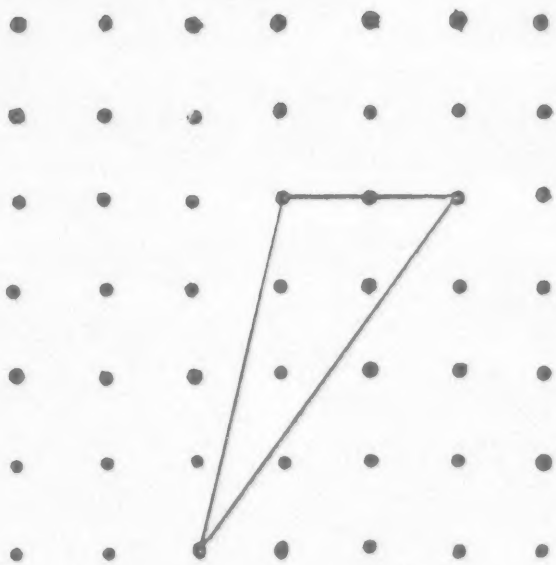


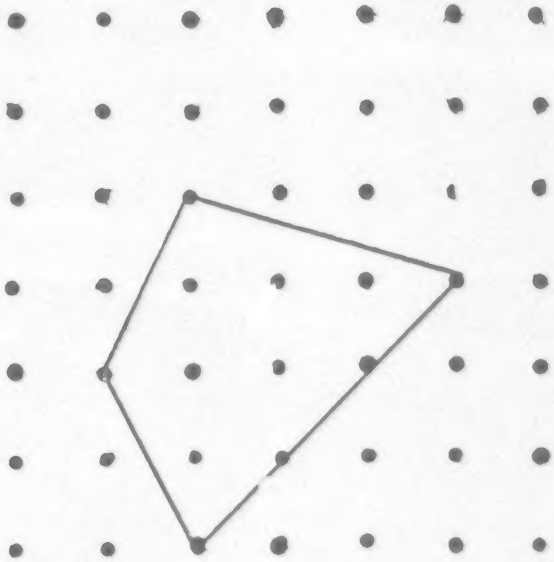


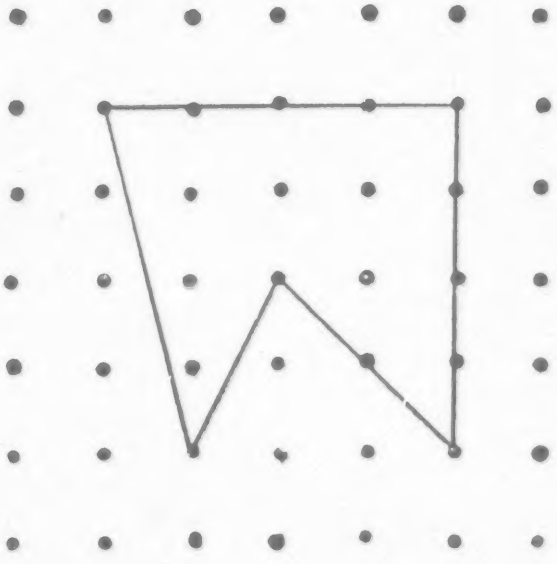


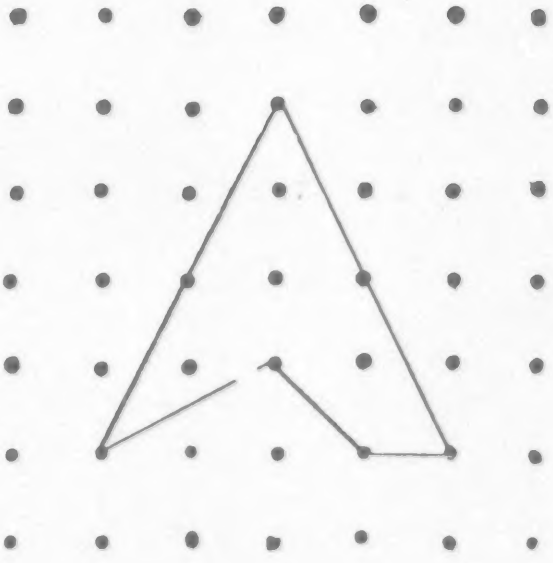


NAME _____



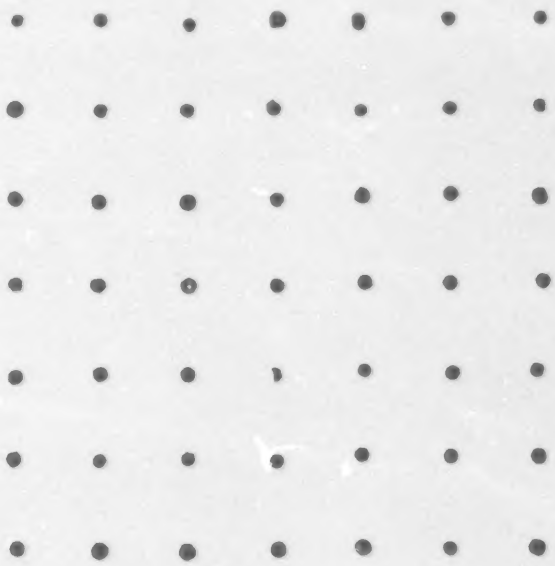






1. Construct a square having an area of four square units.

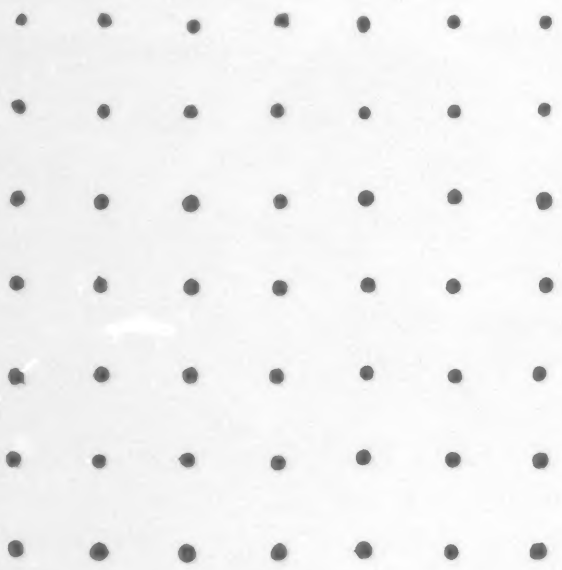
2. Construct a rectangle having an area of 8 square units.



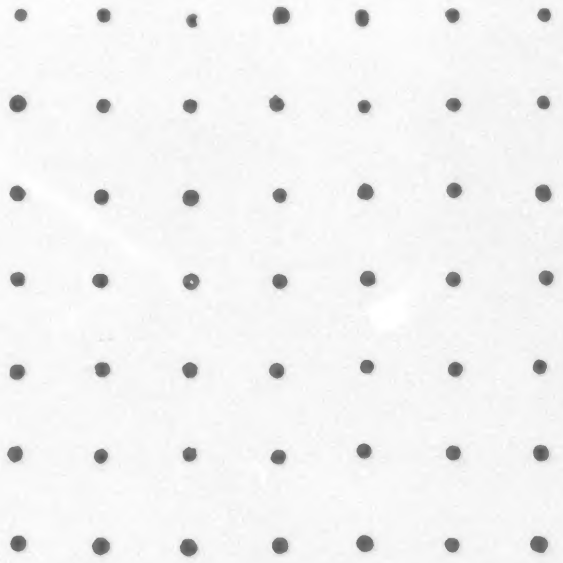
3. Construct a triangle having an area of 6 square units.

4. Construct a triangle having an area of 5 square units.

5. Construct a parallelogram having a area of 8 square units.



6. Construct a square having an area of 16 square units.



7. Construct a trapezoid having an area of 6 square units.

8. Construct a Triangle having an area of 4 1/2 square units.

4. Area (Formulas)

In this lesson we are trying to develop an easier way to find the area of finding the area of a rectangle.

You are to complete the following problems and then discuss them in class.

You have been given 3 woeksheets to do your assignment, be sure to use these for the problem.

Step 1: Use the following table to record your answers.

Figure	length	width	area in square units
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Step 2: Using the worksheets construct 9 different rectangles. Find the area by counting, record the length, width and area on the table.

Step 3: Can you see any relationship between the length width and area?

5. Area of square (Formula)

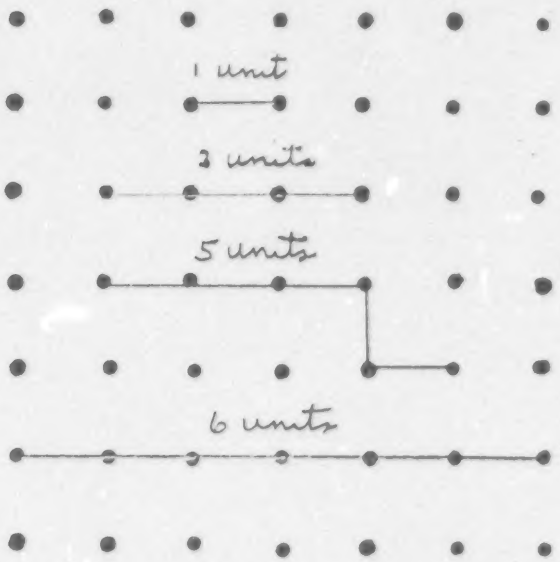
This will be an in class discussion

6. Area of a triangle (formula)

In class discussion

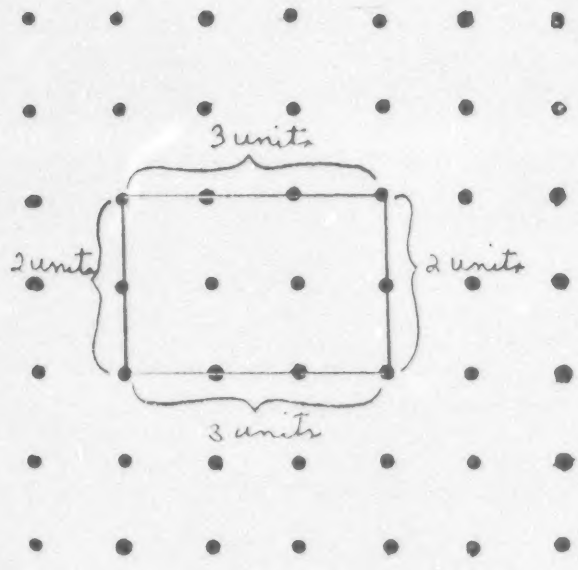
9. Perimeter

The perimeter of a figure in units of length. A unit of length on the geoboard or dot-paper is the distance between any two "vertical" or "horizontal" nails. Examples of such lengths are given in the following figure



To find the perimeter of a figure is found by counting the number of units of length around a figure.

For example the perimeter of the following figure is 10 units long.


3 units
2 units
2 units
3 units

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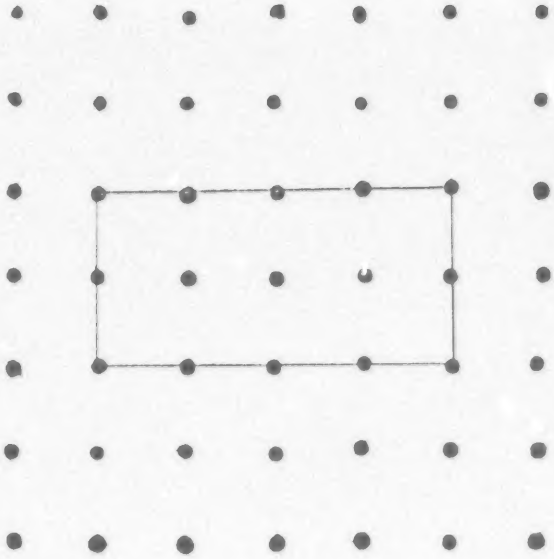

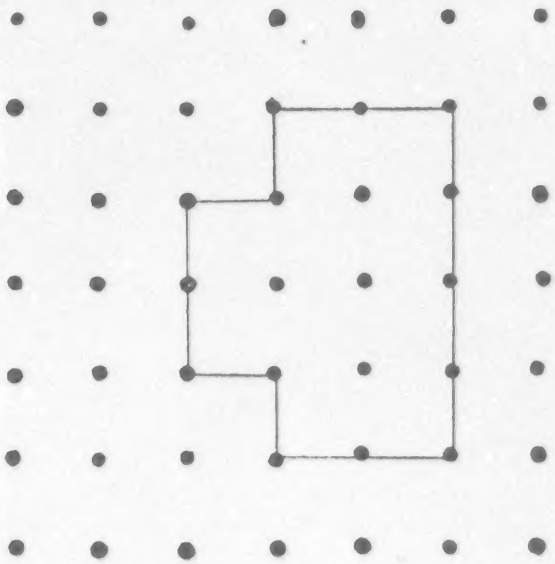

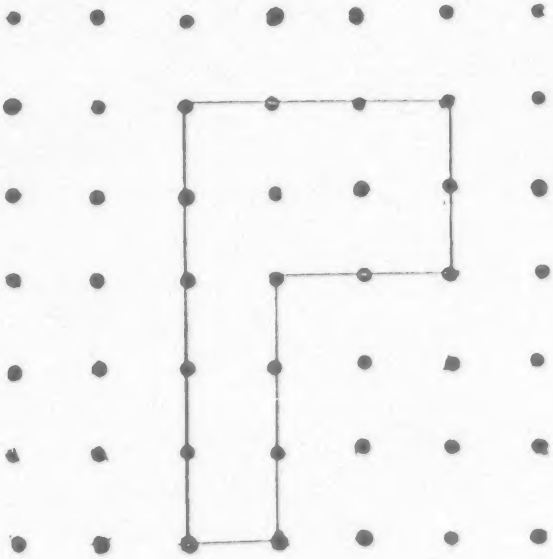

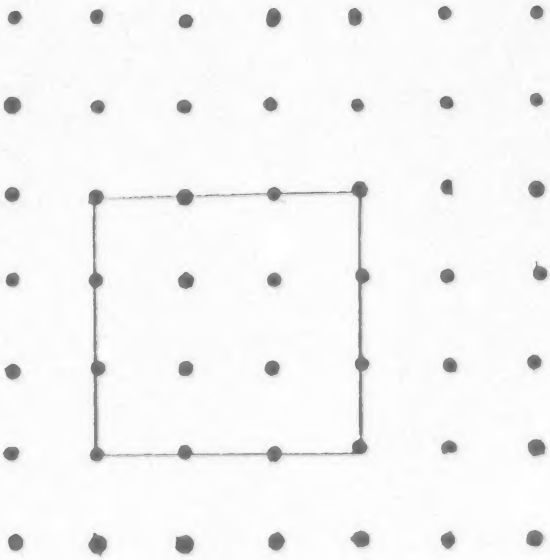

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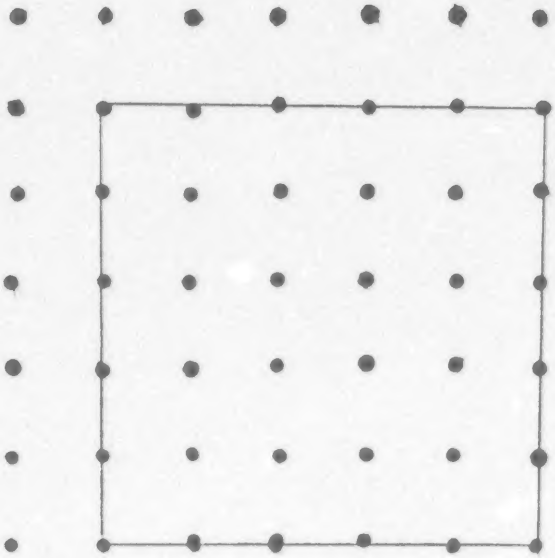

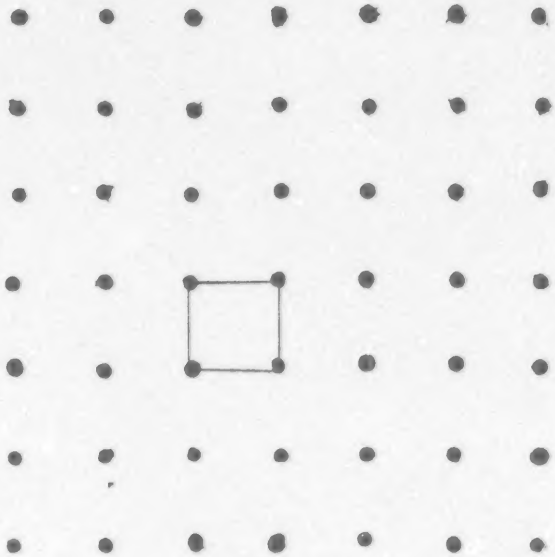

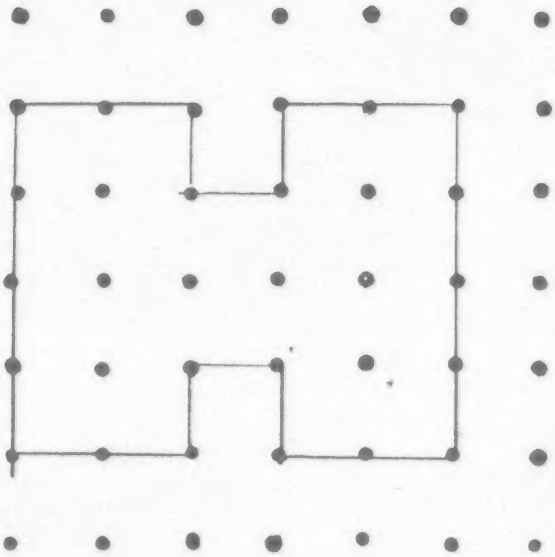

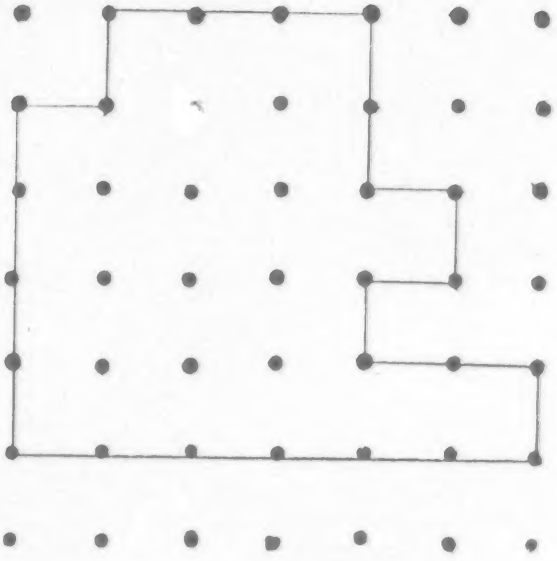

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